

PRESENT TAXONOMIC ATTRIBUTIONS  
OF THE DINOFLAGELLATE CYSTS AND  
ACRITARCHS  
TREATED BY DAVEY, DOWNIE,  
SARJEANT AND WILLIAMS (1966, 1969)

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Pp 25-54

BULLETIN OF  
THE BRITISH MUSEUM (NATURAL HISTORY)  
GEOLOGY                      Appendix II to Supplement 3  
LONDON: 1983

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ISSN 0524-644X

British Museum (Natural History)  
Cromwell Road  
London SW7 5BD

# PRESENT TAXONOMIC ATTRIBUTIONS OF THE DINOFLAGELLATE CYSTS AND ACRITARCHS

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SARJEANT AND WILLIAMS (1966, 1969)

By LINDA A. KRUKIEWICH *and* WILLIAM A. S. SARJEANT

## INTRODUCTION

THE major work here reprinted marked the beginning of a new epoch in systematic work on fossil dinoflagellate cysts, in that it embodied not only the first attempt to formulate a separate morphological terminology for these microfossils but also the first extensive application of the ideas of Evitt (1961, 1963), that archaeopyle character and process shape and distribution could be used as prime criteria in taxonomy.

In the seventeen years that have elapsed since its publication, there has been a further explosive expansion in our observation and comprehension of fossil dinoflagellate cysts, with a consequent expansion of terminology (see Evitt *et al.* 1967, William, Sarjeant & Kidson 1978, Sarjeant 1982a). The importance in taxonomy of such additional characters as the shape of process terminations and the direction of their branches, the exact shape of the archaeopyle, the presence and pattern of minute plates (we would now style them "paraplates") in the mid-ventral region, and the exact relationships of the anterior ventral plates has come to be recognized (see for example Evitt 1967, Lentin & Williams 1976, Sarjeant, 1982b). In contrast, some features – for example, the presence of an ectophragm – are now considered less reliable as means for the separation of taxa. The result has been the reassignment to other genera of many of the species mentioned in the 1966 paper and its first *Appendix* (1969). The diagnoses of many of these genera and species have been greatly modified, a few taxa have been rejected as junior synonyms and some species, then treated as acritarchs, are now recognized to be dinoflagellate cysts.

To simplify understanding of the present taxonomic situation, a checklist is here appended in which the names of all genera and species mentioned in 1966 and in the 1969 *Appendix* are given in alphabetical order. Any revisions to their diagnoses are noted; and the present names, where different to those cited earlier, are indicated. Where their taxonomic allocation remains a matter for controversy, the alternative ideas are noted. The species placed in 1966 into the acritarch genus *Baltisphaeridium* are included in proper alphabetical position; if these are still considered to be acritarchs, that fact is likewise noted. Where taxa appeared under different generic names in 1966 and 1969, both names are included in the list. A full reference section, citing all papers referred to in the list, is appended.

Two papers by the second author which are currently in press (Sarjeant 1983a,b), and may not be published until after this checklist has appeared, include further revisions to the taxonomy of some of these species mentioned herein. Both are restudies of European type material; the first deals with the Oligocene to Miocene taxa described by Maier (1959) and the second with the Jurassic types of Klement (1960). The imminent revisions are not cited here, to avoid priority problems; but the Maier species concerned are marked with a single asterisk (\*), indicating that reference should also be made to Sarjeant (1983a), and the Klement species with a double asterisk (\*\*), suggesting reference to Sarjeant (1983b).

## CHECKLIST

| Past Name  | Present Name   |
|--|--|
| <i>ACANTHOGONYAULAX</i> Sarjeant, 1966b                                | <i>ACANTHAULAX</i> Sarjeant, 1968 [The name <i>Acanthogonyaulax</i> was a <i>jr hom.</i> of a subgenus of <i>Gonyaulax</i> proposed by Kofoid, 1911. The subgenus was elevated to generic status by Graham, 1942.] |
| <i>venusta</i> (Klement, 1960) Sarjeant, 1966b                         | <i>Acanthaulax venusta</i> (Klement, 1960) Sarjeant, 1968  |
| <i>ACHOMOSPHERA</i> Evitt, 1963  |  |
| <i>alcicornu</i> (Eisenack, 1954) Davey & Williams, 1966a              |  |
| <i>grallaeformis</i> (Brosius, 1963) Davey & Williams, 1969            |  |
| <i>hirundo</i> (Eisenack, 1958) Davey & Williams, 1969                 | <i>Cordosphaeridium? hirundo</i> (Eisenack, 1958) Stover & Evitt, 1978   |
| <i>hyperacantha</i> (Deflandre & Cookson, 1955) Davey & Williams, 1969 | <i>Spiniferites hyperacanthus</i> (Deflandre & Cookson, 1955) Cookson & Eisenack, 1974   |
| <i>neptuni</i> (Eisenack, 1958) Davey & Williams, 1966a                |  |
| <i>ramulifera</i> (Deflandre, 1937) Evitt, 1963                        |  |
| <i>ramulifera</i> var. <i>perforata</i> Davey & Williams, 1966a        | [Treated by Lentin & Williams, 1973, as a subspecies.]   |
| <i>sagena</i> Davey & Williams, 1966a                                  |  |
| <i>triangulata</i> (Gerlach, 1961) Davey & Williams, 1969              |  |
| <i>ADNATOSPHERIDIUM</i> Williams & Downie, 1966c                       |  |
| <i>aemulum</i> (Deflandre, 1938) Williams & Downie, 1969               | <i>Rigaudella aemula</i> (Deflandre, 1938) Below, 1982   |
| <i>caulleryi</i> (Deflandre, 1938) Williams & Downie, 1969             |  |
| <i>filamentosum</i> (Cookson & Eisenack, 1958) Williams & Downie, 1969 | <i>Rigaudella filamentosa</i> (Cookson & Eisenack, 1958) Below, 1982   |
| <i>multispinosum</i> Williams & Downie, 1966c                          |  |
| <i>patulum</i> Williams & Downie, 1966c                                | <i>Thalassiphora patula</i> (Williams & Downie, 1966c) Stover & Evitt, 1978  |
| <i>vittatum</i> Williams & Downie, 1966c                               |  |

*APTEODINIUM* Eisenack, 1958*granulatum* Eisenack, 1958*maculatum* Eisenack & Cookson, 1960*AREOLIGERA* Lejeune-Carpentier, 1938;

emend. Williams &amp; Downie, 1966c

*coronata* (O. Wetzel, 1933) Lejeune-Carpentier, 1938*galea* Maier, 1959\**lychnea* (Maier, 1959) Davey *et al.*, 1969\**twistringensis* (Maier, 1959) Davey *et al.*, 1969\**BALTISPHAERIDIUM* Eisenack, 1958;

emend. Downie &amp; Sarjeant, 1963; emend.

Eisenack, 1969

*armatum* (Deflandre, 1937) Downie & Sarjeant, 1963*asteroideum* (Maslov, 1956) Downie & Sarjeant, 1963*claviculorum* (Deflandre, 1938) Downie & Sarjeant, 1963*clavispinulosum* Churchill & Sarjeant, 1963*densicomatum* (Maier, 1959) Gerlach, 1961\**denticulatum* (Courtville in Deflandre, 1946)

Downie &amp; Sarjeant, 1963

*?difforme* (Pritchard, 1841) Downie & Sarjeant, 1963*downiei* Sarjeant, 1960*echinoplax* Churchill & Sarjeant, 1963*fimbriatum* (White, 1842) Sarjeant, 1959*gilsonii* (Kufferath, 1950) Downie & Sarjeant, 1963*horridum* (Deflandre, 1937) Downie & Sarjeant, 1963*huguoniotii* (Valensi, 1955) Downie & Sarjeant, 1963*intermedium* (O. Wetzel, 1933) Downie & Sarjeant, 1963*longofilum* (Maier, 1959) Downie & Sarjeant, 1963\**malleoferum* (White, 1842) Downie & Sarjeant, 1963*mariannae* (Philippot, 1949) Downie & Sarjeant, 1963*panniforme* Gerlach, 1961*pattei* (Valensi, 1948) Sarjeant, 1960*paucifurcatum* (Cookson & Eisenack, 1961)

Downie &amp; Sarjeant, 1965

*pectiniforme* Gerlach, 1961*Cleistosphaeridium armatum* (Deflandre, 1937) Davey, 1969a

Regarded as an acritarch.

*Solisphaeridium claviculorum* Deflandre, 1938; emend. Sarjeant, 1968

Regarded as an acritarch.

Regarded as an acritarch.

Regarded as an acritarch.

*Acanthaulax? downiei* (Sarjeant, 1960) Sarjeant, 1976

Regarded as an acritarch.

Regarded as an acritarch.

Regarded as an acritarch.

Regarded as an acritarch.

*Cleistosphaeridium huguoniotii* (Valensi, 1955) Davey, 1969a*Hystrichosphaeridium intermedium* (O. Wetzel, 1933) Deflandre, 1937

Regarded as an acritarch.

Regarded as an acritarch.

*Achomosphaera mariannae* (Philippot, 1949) Stover & Evitt, 1978*Cleistosphaeridium panniforme* (Gerlach, 1961) Stover & Evitt, 1978*Lanterna? pattei* (Valensi, 1948) Brideaux & Fisher, 1976

Regarded as an acritarch.

*Areosphaeridium? pectiniforme* (Gerlach, 1961) Stover & Evitt, 1978

*BALTISPHAERIDIUM* continued

- plicatum* (Maier, 1959) Downie & Sarjeant, 1963\*
- ?*polyceratum* Takahashi, 1964
- polyozon* Brosius, 1963
- quaternarium* Churchill & Sarjeant, 1963
- saturnium* (Maier, 1959) Downie & Sarjeant, 1963\*
- seminudum* (W. Wetzel, 1952) Downie & Sarjeant, 1963
- spiculatum* (White, 1842) Downie & Sarjeant, 1963
- stimuliferum* (Deflandre, 1938) Sarjeant, 1960
- sylheti* (Baksi, 1962) Downie & Sarjeant, 1963
- telmaticum* Churchill & Sarjeant, 1963
- tinglewoodense* Churchill & Sarjeant, 1963
- varispinosum* Sarjeant, 1959
- whitei* (Deflandre & Courteville, 1939) Downie & Sarjeant, 1963
- BELODINIUM* Cookson & Eisenack, 1960b; emend. Dodekova, 1975
- dysculum* Cookson & Eisenack, 1960b
- BROOMEA* Cookson & Eisenack, 1958; emend. Lentin & Williams, 1976
- ?*longicornuta* Alberti, 1961
- ramosa* Cookson & Eisenack, 1958
- CALLAIOSPHAERIDIUM* Davey & Williams, 1966b; emend. Duxbury, 1980; emend. Below, 1981
- asymmetricum* (Deflandre & Courtville, 1939) Davey & Williams, 1966b
- CANNOSPHAEROPSIS* O. Wetzel, 1933; emend. Williams & Downie, 1966c; emend. May, 1980; emend. Duxbury, 1980
- reticulensis* Pastiels, 1948
- utinensis* O. Wetzel, 1933; emend. Duxbury, 1980
- CARPODINIUM* Cookson & Eisenack, 1962; emend. Leffingwell & Morgan, 1977
- granulatum* Cookson & Eisenack, 1962; emend. Leffingwell & Morgan, 1977
- Regarded as an acritarch.
- Cleistosphaeridium?* *polyozon* (Brosius, 1963) Stover & Evitt, 1978
- Regarded as an acritarch.
- Regarded as an acritarch.
- Regarded as an acritarch.
- Solisphaeridium* *stimuliferum* (Deflandre, 1938) Staplin, Jansonius & Pocock, 1965
- Regarded as an acritarch.
- Hystrichosphaeridium* *sylheti* Baksi, 1962
- Regarded as an acritarch.
- Regarded as an acritarch.
- Sentusidinium?* *varispinosum* (Sarjeant, 1959) Sarjeant & Stover, 1978
- Cometodinium?* *whitei* (Deflandre & Courteville, 1939) Stover & Evitt, 1978
- Imbatodinium* *longicornutum* (Alberti, 1961) Dörhöfer & Davies, 1980
- Adnatosphaeridium* *reticulense* (Pastiels, 1948) De Coninck, 1969

- CLEISTOSPHAERIDIUM* Davey *et al.*, 1966  
*ancoriferum* (Cookson & Eisenack, 1960a) Davey *et al.*, 1966; emend. Cookson & Eisenack, 1968  
*ashdodense* Rossignol, 1962 [Wall, 1967 considered this species to be a *jr* syn. of *Lingulodinium machaerophorum*]  
*danicum* (W. Wetzel, 1952) Davey *et al.*, 1969  
*disjunctum* Davey *et al.*, 1966 [Reid, 1974, considered this species to be a *jr* syn. of *Lingulodinium machaerophorum*]  
*diversispinosum* Davey *et al.*, 1966  
*echinoides* (Maier, 1959) Davey *et al.*, 1969\*  
*ehrenbergii* (Deflandre, 1947) Davey *et al.*, 1969  
*?flexuosum* Davey *et al.*, 1966  
*heteracanthum* (Deflandre & Cookson, 1955) Davey *et al.*, 1966 *Heterosphaeridium? heteracanthum* (Deflandre & Cookson, 1955) Eisenack & Kjellström, 1971  
*israelianum* (Rossignol, 1962) Davey *et al.*, 1966 *Operculodinium israelianum* (Rossignol, 1962) Wall, 1967  
*leve* (Maier, 1959) Davey *et al.*, 1969\*  
*lumectum* (Sarjeant, 1960a) Davey *et al.*, 1969  
*machaerophorum* (Deflandre & Cookson, 1955) Davey *et al.*, 1966 *Lingulodinium machaerophorum* (Deflandre & Cookson, 1955) Wall, 1967  
*multifurcatum* (Deflandre, 1937) Davey *et al.*, 1969  
*?oligacanthum* (W. Wetzel, 1952) Davey *et al.*, 1969  
*pectiniforme* (Gerlach, 1961) Davey *et al.*, 1969 *Areosphaeridium? pectiniforme* (Gerlach, 1961) Stover & Evitt, 1978  
*pilosum* (Ehrenberg, 1843) Davey *et al.*, 1966 *Sentusidinium pilosum* (Ehrenberg, 1843) Sarjeant & Stover, 1978; emend. Erkmen & Sarjeant, 1980  
*polypes* (Cookson & Eisenack, 1962) Davey, 1969a *Bacchidinium polypes* (Cookson & Eisenack, 1962) Davey, 1979  
*polytrichum* (Valensi, 1947) Davey *et al.*, 1969  
*spiralisetum* (De Wit, 1943) Davey *et al.*, 1969  
*tiara* (Klumpp, 1953) Davey *et al.*, 1969  
*tribuliferum* (Sarjeant, 1962b) Davey *et al.*, 1969  
*COMETODINIUM* Deflandre & Courteville, 1939  
*obscurum* Deflandre & Courteville, 1939  
*CORDOSPHAERIDIUM* Eisenack, 1963b; emend. Davey, 1969c; emend. Sarjeant, 1981  
*cantharellum* (Brosius, 1963) Gocht 1969 *Tityrosphaeridium cantharellum* (Brosius, 1963) Sarjeant, 1981  
Holotype lost; exact character and systematic status problematical.

*CORDOSPHAERIDIUM* continued

- ?cracenospinosum* Davey & Williams, 1966b
- diktyoplokus* Klumpp, 1953
- diktyoplokus* subsp. *latum* Klump, 1953
- divergens* (Eisenack, 1954) Eisenack, 1963b
- eoinodes* (Eisenack, 1954) Eisenack, 1963b
- ?erectum* (Manum & Cookson, 1964) Davey & Williams, 1969
- exilimurum* Davey & Williams, 1966b
- ?fasciatum* Davey & Williams, 1966b
- fibrospinusum* Davey & Williams, 1966b
- floripes* (Deflandre & Cookson, 1955) Eisenack, 1963b
- floripes* subsp. *breviradiatum* (Cookson & Eisenack, 1961b) Eisenack, 1963b
- gracile* (Eisenack, 1954) emend. Davey & Williams, 1966b
- latispinosum* Davey & Williams, 1966b
- microtriainum* (Klump, 1953) Eisenack, 1963b
- multispinosum* Davey & Williams, 1966b
- Achomosphaera? cracenospinosa* (Davey & Williams, 1966b) Sarjeant, 1981
- Areosphaeridium diktyoplokus* (Klump, 1953) Eaton, 1971
- Areosphaeridium diktyoplokus* subsp. *latum* (Klumpp, 1953) Lentin & Williams, 1973
- Operculodinium divergens* (Eisenack, 1954) Stover & Evitt, 1978
- Kleithriasphaeridium eoinodes* (Eisenack, 1958) Davey, 1974
- Cleistosphaeridium? erectum* (Manum & Cookson, 1964) Stover & Evitt, 1978
- Hystrichosphaerina? exilimura* (Davey & Williams, 1966b) Sarjeant, 1981
- Kleithriasphaeridium fasciatum* (Davey & Williams, 1966b) Davey, 1974
- Emmetrocyta? fibrospinosa* (Davey & Williams, 1966b) Sarjeant, 1981
- Homotryblium floripes* (Deflandre & Cookson, 1955) Stover, 1975
- Homotryblium floripes* subsp. *breviradiatum* (Cookson & Eisenack, 1961b) Lentin & Williams, 1977
- Tityrosphaeridium gracilis* (Eisenack, 1954) emend. Davey & Williams, 1966b) Sarjeant, 1981
- Tityrosphaeridium? latispinosum* (Davey & Williams, 1966b) Sarjeant, 1981 [Placed earlier into *Achilleodinium* by Bujak *et al.*, 1980; this may prove to be a more correct assignment.]
- Achomosphaera microtriaina* (Klump, 1953) emend. Sarjeant, 1981
- Amphorosphaeridium? multispinosum* (Davey & Williams, 1966b) Sarjeant, 1981
- CTENIDODINIUM* Deflandre, 1938; emend. Sarjeant, 1966b; emend. Sarjeant, 1975
- ornatum* (Eisenack, 1935) Deflandre, 1938
- tenellum* Deflandre, 1938
- CYCLONEPHELIUM* Deflandre & Cookson, 1955; emend. Williams & Downie, 1966c; emend. Ioannides *et al.*, 1976; emend. Sarjeant & Stover, 1978; emend. Stover & Evitt, 1978
- compactum* Deflandre & Cookson, 1955
- divaricatum* Williams & Downie, 1966c
- exuberans* Deflandre & Cookson, 1955
- ordinatum* Williams & Downie, 1966c
- pastielsii* Deflandre & Cookson, 1955
- Glaphyrocysta divaricata* (Williams & Downie, 1966c) Stover & Evitt, 1978
- Glaphyrocysta exuberans* (Deflandre & Cookson, 1955) Stover & Evitt, 1978
- Glaphyrocysta ordinata* (Williams & Downie, 1966c) Stover & Evitt, 1978
- Glaphyrocysta pastielsii* (Deflandre & Cookson, 1955) Stover & Evitt, 1978



- CYMATIOSPHAERA* O. Wetzell, 1933;  
emend. Deflandre, 1954  
*membranacea* (Philippot, 1949) Davey &  
Williams, 1969 Regarded as an acritarch.
- DEFLANDREA* Eisenack, 1938; emend.  
Williams & Downie, 1966c; emend. Lentin  
& Williams, 1976  
*denticulata* Alberti, 1959  
*oebisfeldensis* Alberti, 1959  
*phosphoritica* Eisenack, 1938  
*phosphoritica* subsp. *australis* Cookson &  
Eisenack, 1961a  
*phosphoritica* subsp. *phosphoritica* Eisenack,  
1938  
*wardenensis* Williams & Downie, 1966c  
*Ceratiopsis wardenensis* (Williams & Downie,  
1966c) Bujak *et al.*, 1980
- DICHADOGONYAULAX* Sarjeant, 1966a  
*culmula* (Norris, 1965) Loeblich & Loeblich,  
1968  
*pannea* (Norris, 1965) Sarjeant, 1969  
*schizoblatum* (Norris, 1965) Sarjeant, 1969  
[Considered by Lentin & Williams, 1973 to  
be a *jr syn.* of *Ctenidodinium*]  
[Transferred to *Ctenidodinium* by Lentin &  
Williams, 1973.]  
[Transferred to *Ctenidodinium* by Lentin &  
Williams, 1973.]  
[Transferred to *Ctenidodinium* by Lentin &  
Williams, 1973.]
- DINGODINIUM* Cookson & Eisenack, 1958  
*?albertii* Sarjeant, 1966c  
*jurassicum* Cookson & Eisenack, 1958
- DIPHYES* Cookson, 1965; emend. Davey &  
Williams, 1966b  
*colligerum* (Deflandre & Cookson, 1955)  
Cookson, 1965  
*?monstruosum* (Tasch, 1964) Davey &  
Williams, 1969  
*Coronifera monstruosa* (Tasch, 1964) Stover &  
Evitt, 1978
- DOIDYX* Sarjeant, 1966b  
*anaphrissa* Sarjeant, 1966c  
Shown by Sarjeant & Stover, 1978 to be a *jr*  
*syn.* of *APTEA* Eisenack, 1958; emend.  
Davey & Verdier, 1974; emend. Dörhöfer &  
Davies, 1980  
*Aptea anaphrissa* (Sarjeant, 1966c) Stover &  
Sarjeant, 1978
- DUOSPHERIDIUM* Davey & Williams,  
1966b  
*nudum* (Cookson, 1965) Loeblich & Loeblich,  
1968
- EISENACKIA* Deflandre & Cookson, 1955;  
emend. Sarjeant, 1966b; emend. McLean,  
1973; emend. Stover & Evitt, 1978  
*crassitabulata* Deflandre & Cookson, 1955;  
emend. McLean, 1973

- EXOCHOSPHAERIDIUM* Davey *et al.*, 1966; emend. Davey, 1969  
*palmatum* (Deflandre & Courtville, 1939) Davey *et al.*, 1969  
*phragmites* Davey *et al.*, 1966  
*pseudhystrichodinium* (Deflandre, 1937) Davey *et al.*, 1969  
*striolatum* (Deflandre, 1937) Davey, 1969a
- FROMEA* Cookson & Eisenack, 1958  
*amphora* Cookson & Eisenack, 1958
- GARDODINIUM* Alberti, 1961  
*eisenackii* Alberti, 1961
- GLYPHANODINIUM* Drugg, 1964  
*facetum* Drugg, 1964
- GONYAULACYSTA* Deflandre, 1964; emend. Sarjeant, 1969; emend. Stover & Evitt, 1978; emend. Sarjeant, 1982a  
*?aceras* (Eisenack, 1958) Sarjeant, 1966b  
*aculeata* (Klement, 1960) Sarjeant, 1969  
*aichmetes* Sarjeant, 1966b  
*amabilis* Deflandre, 1939  
*ambigua* (Deflandre, 1939) Sarjeant, 1969  
*apionis* (Cookson & Eisenack, 1958) Sarjeant, 1969  
*aptiana* (Deflandre, 1935) Sarjeant, 1966b  
*axicerastes* Sarjeant, 1966b  
*cassidata* (Eisenack & Cookson, 1960) Sarjeant, 1966b  
*cladophora* (Deflandre, 1938) Sarjeant, 1966b  
*clathrata* (Cookson & Eisenack, 1960b) Sarjeant, 1966b  
*confusa* (Vozzhennikova, 1967) Sarjeant, 1969  
*?cornigera* (Valensi, 1953) Sarjeant, 1966b  
*crassicornuta* (Klement, 1960) Sarjeant, 1966b  
*cretacea* (Neale & Sarjeant, 1962) Sarjeant, 1969  
*crispa* (W. Wetzell, 1967) Sarjeant, 1969  
*dangeardii* Sarjeant, 1968
- Coronifera striolata* (Deflandre, 1937) Stover & Evitt, 1978
- [Davey, 1974, considered this species to be a *jr* syn. of *Gardodinium trabeculosum* (Gocht, 1959) Alberti, 1961.]
- Acanthaulax?* *aceras* (Eisenack, 1958) Stover & Evitt, 1978  
*Acanthaulax aculeata* (Klement, 1960) Stover & Evitt, 1978  
*Millioudodinium aichmetes* (Sarjeant, 1966b) Stover & Evitt, 1978  
*Leptodinium?* *amabile* (Deflandre, 1939) Sarjeant, 1969  
*Rhynchodiniopsis ambigua* (Deflandre, 1939) Sarjeant, 1982a  
*Millioudodinium apionis* (Cookson & Eisenack, 1958) Stover & Evitt, 1978  
*Rhynchodiniopsis aptiana* Deflandre, 1935
- Rhynchodiniopsis cladophora* (Deflandre, 1938) Below, 1981  
*Leptodinium clathratum* (Cookson & Eisenack, 1960b) Sarjeant, 1969  
*Rhynchodiniopsis?* *confusa* (Vozzhennikova, 1967) Sarjeant, 1982a  
*Hystrichogonyaulax cornigera* (Valensi, 1953) Sarjeant, 1969  
*Rhynchodiniopsis crassicornuta* (Klement, 1960) Below, 1981
- Hystrichogonyaulax crispa* (W. Wetzell, 1967) Sarjeant, 1980b  
*Tubotuberella dangeardii* (Sarjeant, 1968) Stover & Evitt, 1978

## GONYAULACYSTA continued

- diaphanis* (Cookson & Eisenack, 1958) Sarjeant, 1969  
*dictyophora* (Deflandre, 1938) Sarjeant, 1967  
*edwardsii* (Cookson & Eisenack, 1958) Clarke & Verdier, 1967  
*eisenackii* (Deflandre, 1938) Dodekova, 1967; emend. Sarjeant, 1982a  
*episoma* Sarjeant, 1966b  
*eumorpha* (Cookson & Eisenack, 1960b) Sarjeant, 1966b  
*exilicristata* Davey, 1969a  
*fetchamensis* Sarjeant, 1966b  
*freakei* (Sarjeant, 1963) Sarjeant, 1966a  
*giuseppei* (Morgenroth, 1966) Sarjeant, 1969  
*gongylos* Sarjeant, 1966b  
*gottisii* Dupin, 1968  
*granulata* (Klement, 1960) Sarjeant, 1969\*\*  
*granuligera* (Klement, 1960) Sarjeant, 1969\*\*  
*hadra* Sarjeant, 1966b  
*helicoidea* (Eisenack & Cookson, 1960) Sarjeant, 1966b  
*hyaloderma* (Deflandre, 1939) Sarjeant, 1967  
*hyalodermopsis* (Cookson & Eisenack, 1958) Sarjeant, 1969  
*jurassica* (Deflandre, 1938) Norris & Sarjeant, 1965; emend. Sarjeant, 1982a  
*kostromiensis* (Vozzhennikova, 1967) Sarjeant, 1969  
*longicornis* (Downie, 1957) Sarjeant, 1969  
*?mamillifera* (Deflandre, 1939) Sarjeant, 1969  
*margaritifera* (Cookson & Eisenack, 1960a) Sarjeant, 1966b  
*microceras* (Eisenack, 1958) Clarke & Verdier, 1967  
*millioudi* (Sarjeant, 1963) Sarjeant, 1966b  
*monacantha* (Deflandre, 1935) Sarjeant, 1967  
*Cribroperidinium diaphanis* (Cookson & Eisenack, 1958) Stover & Evitt, 1978  
*Aldorfia dictyophora* (Deflandre, 1938) Stover & Evitt, 1978  
*Cribroperidinium edwardsii* (Cookson & Eisenack, 1958) Davey, 1969a  
*Rhynchodiniopsis episoma* (Sarjeant, 1966b) Sarjeant, 1982a  
*Leptodinium eumorphum* (Cookson & Eisenack, 1960b) Sarjeant, 1969  
*Cribroperidinium exilicristatum* (Davey, 1969a) Stover & Evitt, 1978  
*Millioudodinium fetchamense* (Sarjeant, 1966b) Stover & Evitt, 1978  
*Leptodinium freakei* (Sarjeant, 1963) Sarjeant, 1969  
*Rhynchodiniopsis? giuseppei* (Morgenroth, 1966) Sarjeant, 1982a  
*Rhynchodiniopsis gongylos* (Sarjeant, 1966b) Sarjeant, 1982a  
*Millioudodinium? gottisii* (Dupin, 1968) Stover & Evitt, 1978  
*Rhynchodiniopsis granulata* (Klement, 1960) Sarjeant, 1982a  
*Rhynchodiniopsis granuligera* (Klement, 1960) Sarjeant, 1982a  
*Rhynchodiniopsis hadra* (Sarjeant, 1966b) Sarjeant, 1982a  
*Rhynchodiniopsis? hyaloderma* (Deflandre, 1939) Sarjeant, 1982a  
*Rhynchodiniopsis hyalodermopsis* (Cookson & Eisenack, 1958) Sarjeant, 1982a  
*Nelchinopsis kostromiensis* (Vozzhennikova, 1967) Wiggins, 1972 [The transfer of this species to *Nelchinopsis* was rejected by Duxbury, 1977]  
*Millioudodinium longicornis* (Downie, 1957) Sarjeant, 1982a  
*Rhynchodiniopsis? mamillifera* (Deflandre, 1939) Sarjeant, 1982a  
*Impagidinium margaritifera* (Cookson & Eisenack, 1960a) Stover & Evitt, 1978  
*Leptodinium millioudii* (Sarjeant, 1963) Sarjeant, 1969  
*Millioudodinium monacanthum* (Deflandre, 1935) Stover & Evitt, 1978

## GONYAULACYSTA continued

- muderongensis* (Cookson & Eisenack, 1958) Sarjeant, 1966b  
*?nannotrix* (Deflandre, 1939) Sarjeant, 1969  
*?nealei* (Sarjeant, 1962b) Sarjeant, 1966b  
*nuciformis* (Deflandre, 1938) Sarjeant, 1968  
*obscura* (Lejeune-Carpentier, 1946) Sarjeant, 1969  
*orthoceras* (Eisenack, 1958) Sarjeant, 1966b  
*pachyderma* (Deflandre, 1938) Sarjeant, 1969  
*palla* Sarjeant, 1966b  
*parorthoceras* Davey, 1968  
*perforans* (Cookson & Eisenack, 1958) Sarjeant, 1969  
*?porosa* (Lejeune-Carpentier, 1946) Sarjeant, 1966b  
*pyra* (Drugg, 1967) Sarjeant, 1969  
*sarjeantii* (Vozzhennikova, 1967) Sarjeant, 1969  
*scarburghensis* Sarjeant, 1964  
*scottii* (Cookson & Eisenack, 1958) Sarjeant, 1969  
*serrata* (Cookson & Eisenack, 1958) Sarjeant, 1969  
*?tenuiceras* (Eisenack, 1958) Sarjeant, 1969  
*tenuicornuta* (Cookson & Eisenack, 1962) Sarjeant, 1969  
*tenuitabulata* (Gerlach, 1961) De Coninck, 1969  
*?transparentis* (Sarjeant, 1959) Sarjeant, 1969  
*wetzeli* (Lejeune-Carpentier, 1939) Sarjeant, 1969; emend. Lejeune-Carpentier & Sarjeant, 1981  
*whitei* Sarjeant, 1966b
- Criboferidinium muderongense* (Cookson & Eisenack, 1958) Davey, 1969a  
*Rhynchodiniopsis? nannotrix* (Deflandre, 1939) Sarjeant, 1982a  
*Hystrichogonyaulax? nealei* (Sarjeant, 1962b) Sarjeant, 1969  
*Millioudodinium nuciformis* (Deflandre, 1938) Sarjeant, 1982a  
*Millioudodinium obscurum* (Lejeune-Carpentier, 1946; emend. Lejeune-Carpentier & Sarjeant, 1981) Sarjeant, 1982a  
*Criboferidinium orthoceras* (Eisenack, 1958) Davey, 1969a  
*Ctenidodinium? pachydermum* (Deflandre, 1938) Gocht, 1970  
*Rhynchodiniopsis palla* (Sarjeant, 1966b) Sarjeant, 1982a  
*Millioudodinium parorthoceras* (Davey, 1968) Stover & Evitt, 1978  
*Rhynchodiniopsis perforans* (Cookson & Eisenack, 1958) Sarjeant, 1982a  
*Leptodinium porosum* (Lejeune-Carpentier, 1946) Sarjeant, 1969; emend. Lejeune-Carpentier & Sarjeant, 1981. [Conceivably a fossil motile dinoflagellate!]  
*Criboferidinium? pyrum* (Drugg, 1967) Stover & Evitt, 1978  
*Rhynchodiniopsis sarjeantii* (Vozzhennikova, 1967) Sarjeant, 1982a
- Millioudodinium? scottii* (Cookson & Eisenack, 1958) Stover & Evitt, 1978  
*Hystrichogonyaulax serrata* (Cookson & Eisenack, 1958) Stover & Evitt, 1978  
*Diacanthum tenuiceras* (Eisenack, 1958) Stover & Evitt, 1978  
*Leptodinium? tenuicornutum* Cookson & Eisenack, 1962  
*Millioudodinium tenuitabulatum* (Gerlach, 1961) Stover & Evitt, 1978
- Rhynchodiniopsis whitei* (Sarjeant, 1966b) Sarjeant, 1982a
- [Considered by Lentin & Williams, 1975 to be a *jr syn.* of *Hystrichodinium* Deflandre, 1935. This judgement, and the resultant transfer of its two constituent species to *Hystrichodinium*, are not accepted by us.]
- patriciae* Neale & Sarjeant, 1962  
*voighti* Alberti, 1961

## HELIODINIUM Alberti, 1961

- HEMICYSTODINIUM* Alberti, 1961  
*zoharyi* (Rossignol, 1962) Wall, 1967
- HESLERTONIA* Sarjeant, 1966b; emend.  
 Duxbury, 1980  
*heslertonensis* (Neale & Sarjeant, 1962) Sarjeant, 1966b
- HOMOTRYBLIUM* Davey & Williams, 1966b  
*pallidum* Davey & Williams, 1966b  
*tenuispinosum* Davey & Williams, 1966b
- HYSTRICHODINIUM* Deflandre, 1935;  
 emend. Clarke & Verdier, 1967  
*compactum* Alberti, 1961  
*oligacanthum* Deflandre & Cookson, 1955  
*pulchrum* Deflandre, 1935  
*ramoides* Alberti, 1961
- HYSTRICHOGONYAULAX* Sarjeant, 1969  
*cornigera* (Valensi, 1953) Sarjeant, 1969  
*nealei* (Sarjeant, 1962b) Sarjeant, 1969
- HYSTRICHOKOLPOMA* Klumpp, 1953;  
 emend. Williams & Downie, 1966a  
*cinctum* Klumpp, 1953  
*clavigerum* (Deflandre, 1937) Williams & Downie, 1969
- eisenacki* Williams & Downie, 1966a
- eisenacki* var. *turgidum* Williams & Downie, 1966a  
*ferox* (Deflandre, 1937) Davey, 1969a
- poculum* Maier, 1959\*  
*rigaudae* Deflandre & Cookson, 1955  
*sequanaportus* Deflandre & Deflandre-Rigaud, 1958  
*unispinum* Williams & Downie, 1966a  
*?xipheum* (Maier, 1959) Davey & Williams, 1969\*
- HYSTRICHOSPHAERA* O. Wetzel, 1933 *ex*  
 Deflandre, 1937  
*buccina* Davey & Williams, 1966a
- cingulata* (O. Wetzel, 1933) Deflandre, 1954
- cingulata* var. *reticulata* Davey & Williams, 1966a
- cornuta* Gerlach, 1961
- Jr syn. of Polysphaeridium*: see Bujak *et al.*, 1980  
*Polysphaeridium zoharyi* (Rossignol, 1962) Bujak *et al.*, 1980
- Florentinia clavigera* (Deflandre, 1937) Davey & Verdier, 1973; emend. Davey & Verdier, 1976  
 [Considered by Damassa, 1979, to be a *jr syn.* of *Hystrichokolpoma cinctum* Klumpp, 1953.]  
*Hystrichokolpoma cinctum* subsp. *turgidum* Lentin & Williams, 1973  
*Florentinia ferox* (Deflandre, 1937) Duxbury, 1980
- Shown by Sarjeant, 1970 to be a *jr syn.* of *Spiniferites* Mantell, 1850  
 Shown by Lentin & Williams, 1973, to be a *jr syn.* of *Spiniferites pseudofurcatus* (Klumpp, 1953) Sarjeant, 1970; emend. Sarjeant, 1981.  
*Pterodinium cingulatum* (O. Wetzel, 1933) Below, 1981  
*Pterodinium cingulatum* subsp. *reticulatum* (Davey & Williams, 1966a) Lentin & Williams, 1981  
*Spiniferites cornutus* (Gerlach, 1961) Sarjeant, 1970

*HYSTRICHOSPHAERA* continued

- cornuta* var. *laevimura* Davey & Williams, 1966a  
*crassimurata* Davey & Williams, 1966a  
*crassipellis* Deflandre & Cookson, 1955  
*leptoderma* (Maier, 1959) Davey & Williams, 1969\*  
*monolis* Davey & Williams, 1966a  
*perforata* Davey & Williams, 1966a  
*ramosa* (Ehrenberg, 1838) O. Wetzell, 1933  
*ramosa* var. *gracilis* Davey & Williams, 1966a  
*ramosa* var. *granosa* Davey & Williams, 1966a  
*ramosa* var. *granomembranacea* Davey & Williams, 1966a  
*ramosa* var. *membranacea* (Rossignol, 1964) Davey & Williams, 1966a  
*ramosa* var. *multibrevis* Davey & Williams, 1966a  
*ramosa* var. *ramosa* (Ehrenberg, 1838) Davey & Williams, 1966a  
*ramosa* var. *reticulata* Davey & Williams, 1966a
- [Treated as a subspecies by Lentin & Williams, 1973.]  
*Spiniferites crassimuratus* (Davey & Williams, 1966a) Sarjeant, 1970  
*Achomosphaera crassipellis* (Deflandre & Cookson, 1955) Stover & Evitt, 1978  
*Spiniferites monolis* (Davey & Williams, 1966a) Sarjeant, 1970  
*Spiniferites perforatus* (Davey & Williams, 1966a) Sarjeant, 1970  
*Spiniferites ramosus* (Ehrenberg, 1838) Mantell, 1857  
*Spiniferites ramosus* var. *gracilis* (Davey & Williams, 1966a) Corradini, 1973 [Treated by Lentin & Williams, 1981, as a subspecies]  
*Spiniferites ramosus* var. *granosus* (Davey & Williams, 1966a) Corradini, 1973 [Treated by Lentin & Williams, 1981, as a subspecies]  
*Spiniferites ramosus* var. *granomembranaceus* (Davey & Williams, 1966a) Corradini, 1973 [Treated by Lentin & Williams, 1981, as a subspecies]  
*Spiniferites membranaceus* (Rossignol, 1964) Sarjeant, 1970  
*Spiniferites ramosus* var. *multibrevis* (Davey & Williams, 1966a) Davey & Verdier, 1971 [Treated by Lentin & Williams, 1981, as a subspecies]  
*Spiniferites ramosus* var. *ramosus* (Ehrenberg, 1838) Loeblich & Loeblich, 1966 [Treated by Lentin & Williams, 1981, as a subspecies]  
*Spiniferites ramosus* var. *reticulatus* (Davey & Williams, 1966a) Davey & Verdier, 1971 [Treated by Lentin & Williams, 1981, as a subspecies]

*HYSTRICHOSPHAERIDIUM* Deflandre,

- 1937; emend. Davey & Williams, 1966b  
*?aquitanicum* Deunff, 1961  
*arborispinum* Davey & Williams, 1966b  
*?arundum* Eisenack & Cookson, 1960  
*bowerbankii* Davey & Williams, 1966b  
*claviferum* (Wilkinson, 1849) Deflandre, 1946  
*?clavigerum* (Deflandre, 1937) Lejeune-Carpentier, 1940  
*costatum* Davey & Williams, 1966b
- Litosphaeridium arundum* (Eisenack & Cookson, 1960) Davey, 1979  
*Florentinia clavigera* (Deflandre, 1937) Davey & Verdier, 1973; emend. Davey & Verdier, 1976  
*Compositosphaeridium costatum* (Davey & Williams, 1966b) Dodekova, 1974

*HYSTRICHOSPHAERIDIUM* continued*deanei* Davey & Williams, 1966b*agliwicense* Mackó 1957*hillii* (Merrill, 1895) Sarjeant, 1964*irregularare* (Merrill, 1895) Sarjeant, 1964*patulum* Davey & Williams, 1966b*polyplasiium* Maier, 1959\**radiculatum* Davey & Williams, 1966b*readei* Davey & Williams, 1966b*salpingophorum* Deflandre, 1935; emend.

Davey &amp; Williams, 1966b

*sheppeyense* Davey & Williams, 1966b*simplicispinum* Davey & Williams, 1966b*stellatum* Maier, 1959\**tridactylites* Valensi, 1955*tubiferum* (Ehrenberg, 1838) Deflandre,  
1937; emend. Davey & Williams, 1966b*tubiferum* var. *brevispinum* Davey &  
Williams, 1966b*HYSTRICHOSPHAEROPSIS* Deflandre,  
1935; emend. Sarjeant, 1966b; emend.

Gocht, 1976

*borussica* Eisenack, 1954*ovum* Deflandre, 1935*wetzeli* (Deflandre, 1937) Sarjeant, 1966b*Florentinia deanei* (Davey & Williams, 1966b)  
Davey & Verdier, 1973*Hystrichosphaeridium speciale* (Merrill, 1895)  
Lentin & Williams, 1981. [At the time of  
the transfer, this name was a *jr hom.* of  
*Hystrichosphaeridium irregularare* Pocock,  
1962; however, the latter species was  
transferred to *Oligosphaeridium* by Davey  
& Williams in Davey *et al.*, 1969. Never-  
theless, Lentin & Williams (1981) con-  
sidered that the name *H. irregularare* (Mer-  
rill) must still be considered a *jr hom.* and  
accordingly proposed the above substitute  
name. Though Art. 55 of the *Inter-  
national Code of Botanical Nomenclature*  
would require reinstatement of the name  
*irregularare* (Merrill) if that species be trans-  
ferred to any genus other than *Oligo-  
sphaeridium*, their procedure appears  
correct.]*Florentinia radiculata* (Davey & Williams,  
1966b) Davey & Verdier, 1976*Kleithriasphaeridium readei* (Davey &  
Williams, 1966b) Davey & Verdier, 1976Shown by Stover & Evitt, 1978, to be a *jr syn.*  
of *Hystrichosphaeridium pseudorecurva-  
tum* Morgenroth, now *Melitasphaeridium*  
*pseudorecurvatum* (Morgenroth, 1966)  
Bujak in Bujak *et al.*, 1980.*Kleithriasphaeridium simplicispinum* (Davey  
& Williams, 1966b) Davey, 1974*Florentinia tridactylites* (Valensi, 1955) Dux-  
bury, 1980[Treated as a subspecies by Lentin &  
Williams, 1973.]*Rottnestia borussica* (Eisenack, 1954) Cookson  
& Eisenack, 1961*Spiniiferites wetzeli* (Deflandre, 1937) Sarjeant,  
1970

*LEPTODINIUM* Klement, 1960; emend.

- Sarjeant, 1982a  
*aceras* (Eisenack, 1958) Sarjeant, 1969  
*aculeatum* Wall, 1967  
*alectrolophum* Sarjeant, 1966b  
*amabilis* (Deflandre, 1939) Sarjeant, 1969  
*arcuatum* Klement, 1960\*\*  
*clathratum* (Cookson & Eisenack, 1960b) Sarjeant, 1969  
*crassinervum* (Deflandre, 1939) Sarjeant, 1969  
*?delicatum* (Davey, 1969a) Sarjeant, 1969  
*eumorphum* (Cookson & Eisenack, 1960b) Sarjeant, 1969  
*freakei* (Sarjeant, 1963) Sarjeant, 1969  
*maculatum* Cookson & Eisenack, 1961  
*margaritiferum* (Cookson & Eisenack, 1961) Sarjeant, 1969  
*membranigerum* Gerlach, 1961  
*millioudi* (Sarjeant, 1963) Sarjeant, 1969  
*mirabile* Klement, 1960\*\*  
*mosaicum* (Downie, 1957) Sarjeant, 1969  
*paradoxum* Wall, 1967  
*sphaericum* Wall, 1967  
*striatum* Wall, 1967  
*striatum* (Clarke & Verdier, 1967) Sarjeant, 1969  
*subtile* Klement, 1960  
*?tenuicornutum* Cookson & Eisenack, 1962

*LITOSPHAERIDIUM* Davey & Williams,

- 1966b; emend. Davey & Verdier, 1973  
*?crassipes* (Reade, 1839) Davey & Williams, 1969  
*?flosculus* (Deflandre, 1937) Davey & Williams, 1969  
*?inversibuccinum* Davey & Williams, 1966b  
*siphoniphorum* (Cookson & Eisenack, 1958) Davey & Williams, 1966b  
*?truncigerum* (Deflandre, 1937) Davey & Williams, 1969

*MEIOUROGONYAULAX* Sarjeant, 1966b

- bulloidea* (Cookson & Eisenack, 1960b) Sarjeant, 1969  
*caytonensis* (Sarjeant, 1959) Sarjeant, 1969

- Acanthaulax? aceras* (Eisenack, 1958) Stover & Evitt, 1978  
*Impagidinium aculeatum* (Wall, 1967) Lentin & Williams, 1981  
*Impagidinium alectrolophum* (Sarjeant, 1966b) Stover & Evitt, 1978  
*Leptodinium amabile* (Deflandre, 1939) Sarjeant, 1969

- Impagidinium maculatum* (Cookson & Eisenack, 1961) Stover & Evitt, 1978  
*Impagidinium margaritiferum* (Cookson & Eisenack, 1961) Stover & Evitt, 1978  
*Impagidinium? membranigerum* (Gerlach, 1961) Stover & Evitt, 1978

- Impagidinium paradoxum* (Wall, 1967) Stover & Evitt, 1978  
*Impagidinium sphaericum* (Wall, 1967) Lentin & Williams, 1981  
*Impagidinium striatum* (Wall, 1967) Stover & Evitt, 1978  
*Impagidinium striatum* (Clarke & Verdier, 1967) Stover & Evitt, 1978

- Florentinia? flosculus* (Deflandre, 1937) Lentin & Williams, 1981  
*Paucisphaeridium inversibuccinum* (Davey & Williams, 1966b) Bujak *et al.*, 1980

- Cordosphaeridium truncigerum* (Deflandre, 1937) De Coninck, 1975



*MEIOUROGONYAULAX* continued

- ?crisulata* (Sarjeant, 1959) Sarjeant, 1969  
*decapitata* (W. Wetzel, 1967) Sarjeant, 1969;  
 emend. Sarjeant, 1980  
*superornata* (W. Wetzel, 1967) Sarjeant,  
 1969; emend. Sarjeant, 1980  
*valensii* Sarjeant, 1966b

*MEMBRANILARNACIA* Eisenack, 1963a;  
 emend. Williams & Downie, 1966c  
*leptoderma* (Cookson & Eisenack, 1958)  
 Eisenack, 1963a  
*reticulata* Williams & Downie, 1966c

[Considered by De Coninck, 1969 and Gocht, 1969 to be a *jr syn.* of *Membranilarnacia ursulae* (Morgenroth, 1966) De Coninck, 1969 now *Eatonicysta ursulae* (Morgenroth, 1966) Stover & Evitt, 1978.]

*MICRODINIUM* Cookson & Eisenack,  
 1960a; emend. Sarjeant, 1966b; emend.  
 Stover & Evitt, 1978  
*ornatum* Cookson & Eisenack, 1960a  
*setosum* Sarjeant, 1966b

*MUDERONGIA* Cookson & Eisenack, 1958  
*mcwhaei* Cookson & Eisenack, 1958  
*staurota* Sarjeant, 1966c

*NEMATOSPHEROPSIS* Deflandre &  
 Cookson, 1955; emend. Williams &  
 Downie, 1966c  
*balcombiana* Deflandre & Cookson, 1955

*NETRELYTRON* Sarjeant, 1961; emend.  
 Sarjeant, 1966c

*jurassicum* (Alberti, 1961) Sarjeant, 1966c

*stegastum* Sarjeant, 1961; emend. Sarjeant,  
 1966c

*trinetrion* Sarjeant, 1966c

[Wiggins, 1975, considered this a *jr syn.* of *Kalyptea* Cookson & Eisenack, 1960b. This judgement was rejected by Sarjeant, 1976.]

*Kalyptea jurassica* Alberti, 1961. [Since this species was not validly transferred in 1966 (see Lentin & Williams, 1981) it must be retained in *Kalyptea*.]

[The transfer of this species to *Kalyptea* by Wiggins, 1975, was rejected by Sarjeant, 1976.]

[The transfer of this species to *Kalyptea* by Wiggins, 1975, was rejected by Sarjeant, 1976.]

*ODONTOCHITINA* Deflandre, 1935; emend.  
 Davey, 1970  
*operculata* (O. Wetzel, 1933) Deflandre &  
 Cookson, 1955

*OLIGOSPHERIDIUM* Davey & Williams,  
 1966b  
*albertense* (Pocock, 1962) Davey & Williams,  
 1969  
*anthophorum* (Cookson & Eisenack, 1958)  
 Davey, 1969a

*OLIGOSPHAERIDIUM* continued

- asterigerum* (Gocht, 1959) Davey & Williams, 1969
- coelenteratum* (Tasch, 1964) Davey & Williams, 1969
- complex* (White, 1842) Davey & Williams, 1969
- dictyophorum* (Cookson & Eisenack, 1958) Davey & Williams, 1969
- dispare* (Tasch, 1964) Davey & Williams, 1969
- irregularare* (Pocock, 1962) Davey & Williams, 1969
- macrotubulum* (Neale & Sarjeant, 1962) Davey & Williams, 1966b
- paradoxum* (Brosius, 1963) Davey & Williams, 1969
- perforatum* (Gocht, 1959) Davey & Williams, 1969
- prolixospinosum* Davey & Williams, 1966b
- pulcherrimum* (Deflandre & Cookson, 1955) Davey & Williams, 1966b
- reniforme* (Tasch, 1964) Davey, 1969a
- reticulatum* Davey & Williams, 1966b
- vasiformum* (Neale & Sarjeant, 1962) Davey & Williams, 1966b
- PARANETRELYTRON* Sarjeant, 1966c
- strongylum* Sarjeant, 1966c
- PAREODINIA* Deflandre, 1947; emend. Wiggins, 1975; emend. Stover & Evitt, 1978
- ceratophora* Deflandre, 1947; emend. Gocht, 1970
- Shown by Stover & Evitt, 1978, to be a *jr syn.* of *Oligosphaeridium irregularare* (Pocock, 1962) Davey & Williams, 1969
- Shown by Stover & Evitt, 1978, to be a *jr syn.* of *Oligosphaeridium irregularare* (Pocock, 1962) Davey & Williams, 1969
- [Considered by McIntyre & Brideaux, 1980, to be a *jr syn.* of *Oligosphaeridium vasiformum* (Neale & Sarjeant, 1962) Davey & Williams, 1966b; the latter species is in turn considered a *jr syn.* of *Oligosphaeridium asterigerum* (Gocht, 1959) Davey & Williams, 1969, by Duxbury, 1977.]
- Bipolaribucina paradoxa* (Brosius, 1963) "Jiabo" 1978
- Shown by Stover & Evitt, 1978, to be a *jr syn.* of *Oligosphaeridium irregularare* (Pocock, 1962) Davey & Williams, 1969.
- [Considered by Duxbury, 1977, to be a *jr syn.* of *Oligosphaeridium asterigerum* (Gocht, 1959) Davey & Williams, 1969. This judgment is not accepted by us.]
- [Considered by Wiggins, 1975, to be a *jr syn.* of *Pareodinia* Deflandre, 1947. This judgment was rejected by Sarjeant, 1976.]
- [Considered by Wiggins, 1975, to be a *jr syn.* of *Pareodinia ceratophora* Deflandre, 1947. This judgement was rejected by Sarjeant, 1976.]

*PERISSEIASPHAERIDIUM* Davey & Williams, 1966b  
*eisenackii* (Eisenack, 1958) Davey & Williams, 1969

*pannosum* Davey & Williams, 1966b

*PLURIARVALIUM* Sarjeant, 1962a

*osmingtonense* Sarjeant, 1962b

*POLYSPHAERIDIUM* Davey & Williams, 1966b; emend. Bujak *et al.*, 1980

?*asperum* (Maier, 1959) Davey & Williams, 1969\*

?*belgicum* Sarjeant, 1969

?*deflandrei* (Valensi, 1947) Davey & Williams, 1969

?*fabium* (Tasch, 1964) Davey & Williams, 1969

?*fluctuans* (Pastiels, 1948) Davey & Williams 1966b

?*folium* (Tasch, 1964) Davey & Williams, 1969

?*fucosum* (Valensi, 1955) Davey & Williams, 1969

*laminaspinosum* Davey & Williams, 1966b

?*major* (Lejeune-Carpentier, 1940) Davey & Williams, 1969

?*marsupium* (Tasch, 1964) Davey & Williams, 1969

*pastielsi* Davey & Williams, 1966b

?*paulinae* (Valensi, 1953) Davey & Williams, 1969

?*perovatum* (Tasch, 1964) Davey & Williams, 1969

?*polyopes* (Cookson & Eisenack, 1962) Davey & Williams, 1966b

*pumilum* Davey & Williams, 1966b

?*rhabdophorum* (Valensi, 1955) Davey & Williams, 1969

?*simplex* (White, 1842) Davey & Williams, 1969

[Considered by Davey & Verdier, 1974 and Duxbury, 1980, to be a *jr syn.* of *Hystrichosphaerina schindewolfii* Alberti, 1961.]

[Considered by Wiggins, 1975 and Dörhöfer & Davies, 1980 to be a *jr syn.* of *Pareodinia Deflandre*, 1947. We concur with Stover & Evitt, 1978, who neither accept this judgement nor the resultant transfer of the type species.]

*Dapsilidinium asperum* (Maier, 1959) Bujak *et al.*, 1980\*

*Dapsilidinium?* *belgicum* (Sarjeant, 1969) Lentin & Williams, 1981

*Dapsilidinium?* *deflandrei* (Valensi, 1947) Lentin & Williams, 1981

Shown by Stover & Evitt, 1978, to be a synonym of *Kiokansium unituberculatum* (Tasch, 1964) Stover & Evitt, 1978

The taxonomic transfer of this species was not validly made; therefore it must remain in *Hystrichosphaeridium*.

Shown by Stover & Evitt, 1978, to be a synonym of *Kiokansium unituberculatum* (Tasch, 1964) Stover & Evitt, 1978.

*Dapsilidinium?* *fucosum* (Valensi, 1955) Lentin & Williams, 1981

*Dapsilidinium laminaspinosum* (Davey & Williams, 1966b) Lentin & Williams, 1981

*Dapsilidinium?* *major* (Lejeune-Carpentier, 1940) Lentin & Williams, 1981

Shown by Stover & Evitt, 1978, to be a synonym of *Kiokansium unituberculatum* (Tasch, 1964) Stover & Evitt, 1978.

*Dapsilidinium pastielsii* (Davey & Williams, 1966b) Bujak *et al.*, 1980

*Dapsilidinium?* *paulinae* (Valensi, 1953) Lentin & Williams, 1981

Shown by Stover & Evitt, 1978, to be a synonym of *Kiokansium unituberculatum* (Tasch, 1964) Stover & Evitt, 1978.

*Bacchidinium polyopes* (Cookson & Eisenack, 1962) Davey, 1979

*Dapsilidinium?* *pumilum* (Davey & Williams, 1966b) Lentin & Williams, 1981

*Dapsilidinium?* *rhabdophorum* (Valensi, 1955) Lentin & Williams, 1981

*Dapsilidinium simplex* (White, 1842) Bujak *et al.*, 1980

*POLYSPHAERIDIUM* continued

*subtile* Davey & Williams, 1966b; emend.  
Bujak *et al.*, 1980  
*tribrachiosum* (Tasch, 1964) Davey &  
Williams, 1969

*zoharyi* (Rossignol, 1962) Bujak *et al.*, 1980

*PROLIXOSPHAERIDIUM* Davey *et al.*,  
1966  
*deirense* Davey *et al.*, 1966

*granulosum* (Deflandre, 1937) Davey *et al.*,  
1966

*mixtispinosum* (Klement, 1960) Davey *et al.*,  
1969\*\*

*parvispinum* (Deflandre, 1937) Davey *et al.*,  
1969

?*xanthiopyxides* (O. Wetzell, 1933) Davey *et al.*,  
1969

*PSALIGONYAULAX* Sarjeant, 1966b

*apatela* (Cookson & Eisenack, 1960b) Sar-  
jeant, 1969

*deflandrei* Sarjeant, 1966b

*simplicia* (Cookson & Eisenack, 1961) Sar-  
jeant, 1969

*RAPHIDODINIUM* Deflandre, 1936  
*fucatum* Deflandre, 1936

*RHAETOGONYAULAX* Sarjeant, 1966b;  
emend. Harland *et al.*, 1975; emend.  
Fisher & van Helden, 1979  
*chaloneri* (Sarjeant, 1963) Sarjeant 1969

*rhaetica* (Sarjeant, 1963) Loeblich & Loe-  
blich, 1968; emend. Harland *et al.*, 1975

*RHYNCHODINIOPSIS* Deflandre, 1935;  
emend. Below, 1981; emend. Sarjeant,  
1982a  
*aptiana* Deflandre, 1935; emend. Sarjeant,  
1982a

*SIRMIODINIUM* Alberti, 1961; emend.  
Warren, 1973  
*grossi* Alberti, 1961; emend. Warren, 1973

*SURCULOSPHAERIDIUM* Davey *et al.*,  
1966  
*cribrotubiferum* (Sarjeant, 1960) Davey *et al.*,  
1966

Shown by Stover & Evitt, 1978, to be a syn-  
onym of *Kiokansium unituberculatum*  
(Tasch, 1964) Stover & Evitt, 1978.

[Considered by Davey & Verdier, 1974, to be  
a *jr syn.* of *Prolixosphaeridium parvi-  
spinum* (Deflandre, 1937) Davey *et al.*,  
1969.]

*Tanyosphaeridium xanthiopyxides* (O. Wetzell,  
1933) Stover & Evitt, 1978

*Tubotuberella apatela* (Cookson & Eisenack,  
1960b) Ioannides *et al.*, 1976; emend. Sar-  
jeant, 1982a. [The previous placement of  
this species as the type for the new genus  
*Glabridinium* by Brideaux, 1977, was re-  
jected by Sarjeant, 1982a.]

*Impagidinium? simplicium* (Cookson & Eisen-  
ack, 1961) Stover & Evitt, 1978

*Rhaetogonyaulax rhaetica* subsp. *chaloneri* (Sar-  
jeant, 1963) Lentin & Williams, 1977

*SURCULOSPHAERIDIUM* continued*longifurcatum* (Firtion, 1952) Davey *et al.*, 1966*vestitum* (Deflandre, 1938) Davey *et al.*, 1966*SYSTEMATOPHORA* Klement, 1960*areolata* Klement, 1960*placacantha* (Deflandre & Cookson, 1955)Davey *et al.*, 1966; emend. May, 1980*schindewolfi* (Alberti, 1961) Downie & Sarjeant, 1965*Hystrichosphaerina schindewolfi* Alberti, 1961.[The genus *Hystrichosphaerina*, rejected as a *jr syn.* of *Systematophora* by Neale & Sarjeant (1962), was reinstated under an emended definition by Stover & Evitt, 1978.]*TANYOSPHAERIDIUM* Davey & Williams, 1966b*ellipticum* (Cookson, 1965) Davey & Williams, 1969*isocalamum* (Deflandre & Cookson, 1955) Davey & Williams, 1969*regulare* Davey & Williams, 1966b*variecalamum* Davey & Williams, 1966b*THALASSIPHORA* Eisenack & Gocht, 1960; emend. Gocht, 1968*delicata* Williams & Downie, 1966c; emend. Eaton, 1976*pelagica* (Eisenack, 1954) Eisenack & Gocht, 1960*WANAEA* Cookson & Eisenack, 1958; emend. Fensome, 1981*spectabilis* (Deflandre & Cookson, 1955) Cookson & Eisenack, 1958*WETZELIELLA* Eisenack, 1938; emend. Williams & Downie, 1966b; emend. Lentin & Williams, 1976*articulata* Eisenack, 1938*articulata* var. *conopia* Williams & Downie, 1966b*clathrata* Eisenack, 1938*coleothrypta* Williams & Downie, 1966b*condylos* Williams & Downie, 1966b*homomorpha* Deflandre & Cookson, 1955*homomorpha* var. *quinquelata* Williams & Downie, 1966b*ovalis* Eisenack, 1954*Distatodinium ellipticum* (Cookson, 1965) Eaton, 1976[Since the other constituent subgenera have either been raised to generic status or abandoned, the type subgenus *Wetziella* has now fallen into disuse.]*Kisselovia tenuivirgula* subsp. *conopia* (Williams & Downie, 1966b) Costa & Downie, 1979*Kisselovia*? *clathrata* (Eisenack, 1938) Lentin & Williams, 1976*Kisselovia coleothrypta* (Williams & Downie, 1966b) Lentin & Williams, 1976*Dracodinium condylos* (Williams & Downie, 1966b) Costa & Downie, 1979*Apectodinium homomorphum* (Deflandre & Cookson, 1955) Lentin & Williams, 1977; emend. Harland, 1979*Apectodinium quinquelatum* (Williams & Downie, 1966b) Costa & Downie, 1979

## WETZELIELLA continued

- reticulata* Williams & Downie, 1966b
- similis* Eisenack, 1954
- solida* (Gocht, 1955) Williams & Downie, 1966b
- symmetrica* Weiler, 1956
- symmetrica* var. *lobisca* Williams & Downie, 1966b
- tenuivirgula* Williams & Downie, 1966b
- tenuivirgula* var. *crassiramosa* Williams & Downie, 1966b
- varielongituda* Williams & Downie, 1966b
- Kisselovia reticulata* (Williams & Downie, 1966b) Lentin & Williams, 1976
- Dracodinium simile* (Eisenack, 1954) Costa & Downie, 1979
- Dracodinium solidum* Gocht, 1955
- Wetzelietta meckelfeldensis* subsp. *lobisca* (Williams & Downie, 1966b) Costa & Downie, 1979
- Kisselovia tenuivirgula* (Williams & Downie, 1966b) Lentin & Williams, 1976
- Kisselovia crassiramosa* (Williams & Downie, 1966b) Damassa, 1979
- Dracodinium varielongitutum* (Williams & Downie, 1966b) Costa & Downie, 1979
- Raised to generic status by Gocht, 1955; emend. Bujak, 1979.
- Rhombodinium draco* Gocht, 1955
- Rhombodinium glabra* (Cookson, 1956) Vozzhennikova, 1967
- WETZELIELLA (RHOMBODINIUM)**
- Gocht, 1955
- draco* Gocht, 1955
- glabra* Cookson, 1956
- XIPHORIDIUM** Sarjeant, 1966b
- alatum* (Cookson & Eisenack, 1962) Sarjeant, 1966b

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Accepted for publication 15 December 1982

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